

REMARKS

Applicants have amended their specification in order to consistently refer to reference characters 40A and 40B, with respect to the hollow shape members disposed respectively at the center area of the railway car and at the ends of the railway car, the hollow shape members at the ends formed of material softer than that of the hollow shape members disposed at the center area of the railway car. It is respectfully submitted that these amendments to the specification do not add new matter to the application.

Applicants have amended their claims in order to further define and clarify the subject matter of the claimed invention. In particular, claim 1 has been amended to recite both longitudinal ends of the "railway car", and to recite that material of the longitudinal ends is material formed by annealing. Claims 2 - 5 have been amended in light of suggestions by the Examiner to overcome the claim objections in Item 5 on pages 3 and 4 of the Office Action mailed February 27, 2003, and to provide antecedent basis for various recitations previously in the claims.

Applicants have amended claim 6 to recite the railway car, rather than car body; and to recite that the material used to form both longitudinal ends of the railway car is softer than material used to form the longitudinal center portions thereof, with material used to form the longitudinal ends being material formed by annealing. Claims 7 - 14 have been amended in light of suggestions by the Examiner in these claim objections in Item 5, in order to provide antecedent bases for various recitations in the claims, and in order to clarify various recitations therein.

Claim 16 has been amended to recite that both ends of a respective car body, of the railway car formation, constituting a portion of a passenger room, are equipped with parts that shrink in the longitudinal direction of this car body when this

car body collides against another car body which is adjacent thereto. Claim 17 has been amended to recite that material for forming the both ends of an underframe of the respective car body is softer than material for forming a longitudinal center area thereof, with the material for forming the both ends being material formed by annealing.

As for formation of the softer material by annealing, note, for example, the paragraph bridging pages 7 and 8, as well as the paragraph bridging pages 10 and 11, of applicants' specification.

In addition, applicants are adding new claims 18 - 25 to the application.

Claims 18 and 19, dependent respectively on claims 1 and 6, each recites that material used in forming the longitudinal center portions and the longitudinal ends have a same composition, with material of the longitudinal ends having been made softer by the annealing. Claim 20, dependent on claim 17, recites that material used in forming the both ends of the underframe of each car body and material used in forming the longitudinal center area thereof have a same composition, with material of the both ends having been made softer by the annealing. Claims 21 and 22, dependent respectively, on claims 3 and 4, respectively recites that the side sills, and that the one or more center sills, are provided with elongated holes (note the sole full paragraph on page 7 of applicants' specification); and claim 23, dependent on claim 1, recites that each of the longitudinal ends of the railway car, which are softer, extend 100 to 500 mm (note, for example, the paragraph bridging pages 7 and 8, as well as the paragraph bridging pages 11 and 12, of applicants' specification). Claims 24 and 25 respectively set forth the subject matter of previously considered claims 8 and 14 in independent form, with amendments in light of the rejections under the second paragraph of 35 USC 112; noting Item 12 on

pages 10 and 11 of the Office Action mailed February 27, 2003, it is respectfully submitted that claims 24 and 25 should be allowed.

The objections to the drawings as set forth in Items 1 and 2 on page 2 of the Office Action mailed February 27, 2003, are noted. The drawings have been amended to include reference characters 40A and 40B, consistent with amendments to the specification. The reference characters 40A and 40B in combination represent the complete hollow shape members respectively of harder and softer materials; and it is respectfully submitted that in view of the amendments to the drawings, the objections thereto as set forth in Items 1 and 2 on page 2 of the Office Action mailed February 27, 2003, are moot.

The objection to the drawings as set forth in Item 3 on page 2 of the Office Action mailed February 27, 2003, is respectfully traversed, in view of the following.

Thus, the Examiner's attention is respectfully directed to Fig. 10 and the corresponding description in connection therewith in the paragraph bridging pages 10 and 11 of applicants' specification. It is respectfully submitted that applicants' original drawings, particularly Fig. 10, show the subject matter of claim 9 such that the feature of the invention in claim 9 is shown in the drawings.

The objection to the specification as set forth in Item 4 on page 3 of the Office Action mailed February 27, 2003, is noted. In view of present amendments to the specification, this objection is moot.

Objection to the claims as set forth in Item 5 on pages 3 and 4 of the Office Action mailed February 27, 2003, is noted. Applicants respectfully thank the Examiner for the suggested amendments to the claims, for overcoming the claim objections. Applicants have amended their claims in light of the suggested

amendments thereto for overcoming the claim objections; and in view of the present amendments, it is respectfully submitted that the claim objections are now moot.

Of the claim objections, attention is respectfully directed to reference by the Examiner to "claim 3, line 2", in line 9 of Item 5. The suggested amendment has been made in claim 4, line 2, which applicants contend is the appropriate location for the claim amendment referred to by the Examiner in connection with "claim 3, line 2".

Applicants respectfully traverse the rejection of their claims under the second paragraph of 35 USC 112, as set forth in Item 7 bridging pages 4 - 8 of the Office Action mailed February 27, 2003, particularly insofar as this rejection is applicable to the claims as presently amended. Thus, applicants have amended their claims in light of allegations by the Examiner of insufficient antecedent basis and allegedly unclear terms and allegedly confusing recitations. In view of the present amendments to the claims, it is respectfully submitted that the rejections under the second paragraph of 35 USC 112, are moot.

Specifically, applicants note the allegation by the Examiner that, in claim 2, the phrase set forth in lines 3 - 6 is confusing "as it is unclear whether [applicants are] claiming the same structure [in claim 2] as recited above in claim 1." Claim 1 recites generally material in the underframe, while, for example, claim 2 more specifically defines the structure of the railway car which has portions of differing softness. Contrary to the contention by the Examiner, it is respectfully submitted that the claims are clear with respect to the structure being claimed.

Applicants respectfully traverse the conclusion by the Examiner that the various phrases referred to in lines 4 - 9 on page 6 of the Office Action mailed February 27, 2003, in claims 8 and 14, are confusing, particularly insofar as the allegations are applicable to claims 24 and 25, respectively. Thus, claim 24 recites

that each of the first hollow shape members and the second hollow shape members include two face plates and a connecting member extending between the two face plates; similarly, claim 25 recites that each of the plural second hollow shape members includes two face places and a connecting member connecting between the two face plates. Moreover, claim 24 refers to first and second hollow shape members respectively disposed at both ends of the railway car and at the center portion thereof; and claim 25 consistently recites plural second hollow shape members disposed at both ends of the car body and plural second hollow shape members disposed at the center portion thereof, consistent with claim 13. Thus, it is respectfully submitted that the claims are not confusing, and are consistent, in reciting the various hollow shape members.

Applicants respectfully traverse the contention by the Examiner in the last two lines on page 7 of the Office Action mailed February 27, 2003, that in claim 16, the phrase "another car body" is confusing; note that claim 16 recites another car body being adjacent thereto (that is being adjacent to the respective car body); it is respectfully submitted that the complete phrase of "another car body being adjacent thereto" clearly sets forth the claimed structure so as to satisfy requirements of the second paragraph of 35 USC 112.

As can be seen from the foregoing, as well as from the extensive amendments applicants have made to their claims, applicants have amended their claims in a bona fide attempt to resolve all issues raised by the Examiner under the second paragraph of 35 USC 112. If the Examiner is of the opinion that any issues remain under 35 USC 112, second paragraph, the Examiner is respectfully requested to contact the undersigned so as to schedule an interview for overcome

any such remaining issues. The Examiner is thanked in advance for cooperating with this request.

Applicants respectfully submit that all of the claims now presented for consideration by the Examiner patentably distinguish over the teachings of the references applied by the Examiner in rejecting claims in the Office Action mailed February 27, 2003, that is the teachings of the U.S. patents to Pavlick, et al, No. 4,715,292, and to Kawasaki, et al, No. 6,394,000, under the provisions of 35 USC 102 and 35 USC 103.

Initially, note that U.S. Patent No. 6,394,000 to Kawasaki, et al, has only been applied under 35 USC 103(a). Secondly, note that Kawasaki, et al, qualifies as prior art in connection with the presently claimed subject matter only under 35 USC 102(e), Kawasaki, et al, having a publication (patenting) date of May 28, 2002, after the actual U. S. filing date of the above-identified application. But note that Kawasaki, et al also refers to a corresponding International (PCT) application, which was published as No. WO 00/18630, with a publication date of April 6, 2000. In any event, note that the above-identified application was filed on February 27, 2002 and thus revisions to 35 USC 103(a) are applicable to the above-identified application.

Finally, it is represented by the undersigned that the above-identified application and No. 6,394,000 are commonly assigned, to Hitachi, Ltd.

In view of the all of the foregoing, it is respectfully submitted that U.S. Patent No. 6,394,000 does not qualify as prior art under 35 USC 103(a) (that is, No. 6,394,000 is disqualified as prior art). See, Manual of Patent Examining Procedure 706.02(I)(1). For this reason alone, the rejection under 35 USC 103(a) using the teachings of U.S. Patent No. 6,394,000 must fail.

However, the Examiner's attention is again directed to the corresponding published International (PCT) application corresponding to U.S. Patent No. 6,394,000.

In any event, it is respectfully submitted that the references as applied by the Examiner would have neither taught nor would have suggested such a railway car, or such railway car formation, as in the present claims, including, inter alia, wherein material forming longitudinal ends of the railway car body is softer than material used to form the longitudinal center portion thereof, with material of the longitudinal ends being material formed by annealing. See, claim 1. Note also claim 6. See further, claim 17.

In addition, it is respectfully submitted that these references would have neither disclosed nor would have suggested such a railway car, or such a railway car formation, as in the present claims, having the features as discussed previously, and further, wherein the material used in forming the center portions and ends have a same composition, which material of the ends having been made softer by the annealing. Note claims 18 - 20.

Furthermore, it is respectfully submitted that the teachings of the applied prior art would have neither disclosed nor would have suggested such a railway car formation as in the present claims, wherein both ends of a respective car body, of the railway car formation, constituting a portion of a passenger room, is equipped with parts that shrink in the longitudinal direction of the respective car body when the respective car body collides against another car body adjacent thereto. See claim 16.

Moreover, it is respectfully submitted that the teachings of the applied references would have neither disclosed nor would have suggested the other

aspects of the present invention as in the remaining, dependent claims, including (but not limited to) the members having the softer portion at the ends as in claims 2 – 5 and 10-13; and/or wherein the center and end portions are formed of separate members, which are respectively bonded (see, e.g., claim 7); and/or wherein the hollow shape members having softer ends and a center portion are formed as one hollow shape member (see claims 9 and 15; note Fig. 10).

The present invention is directed to a railway car, and a railway car formation using railway cars, particularly appropriate when the railway car body is composed of hollow shape members, made, for example, of light (e.g., aluminum) alloy, and particularly is directed to such a railway car wherein a shock of a collision is reduced and impact force to passengers on board the railway car is reduced.

Various techniques have been used in order to limit/relieve impact force of a collision of a railway car, to the passengers on board. Such techniques include providing a strengthening member to the lower surface of an underframe at the end portion of a passenger car, so as to realize a strong structure. However, where a strong structure at the underframe is provided, the underframe will not collapse even if underframes collide against each other (since they are built firmly), and thus, the impact of collision is not relieved.

Against this background, applicants provide railway car structure in which impact is relieved and the impact force is absorbed. Applicants have found that by providing railway car structure, for example, underframe structure, wherein material of the longitudinal ends of the structure are softer than material constituting the longitudinal center area, objectives according to the present invention are achieved. Through use of the softer material, impact force can be relieved at the longitudinal

end portions of the car body, protecting the center portion from the impact force (this center portion being where, in general, the passengers are located).

In addition, applicants achieve this relatively softer material for the longitudinal end portions by a relative simple technique of forming the longitudinal ends of material by annealing. Through use of the annealing, a relatively soft material is achieved, as described in the sole full paragraph on page 8 of applicants' specification. In addition, through use of the annealing technique to soften the hollow shape member, it becomes easy to provide the hollow shape member as a single member having softer end portions, whereby the softer end portions can be provided without welding of the end portions to a central portion, and the members of different softness can be provided by the annealing. Note, for example, the paragraph bridging pages 10 and 11 of applicants' specification.

Moreover, applicants provide a railway car useful for passengers, wherein impact force is avoided, and thus, injury to passengers can be at least reduced.

Pavlick, et al discloses a lead or head end car placed in front of a propulsion car, such as a locomotive, and designed to carry control equipment and crew, this lead or head end car including a center frame or cage of very high strength for the crew, and the lead or head end car further including front and rear collapsible portions, on either side of the center frame, which are collapsible to absorb the kinetic energy in the event of a crash. On a maximum crash situation, this patent discloses that the collapsible portions tend to force the center frame upwardly and out of the direct line of the crash forces. Note the paragraph bridging columns 1 and 2 of this patent. See, also Figs. 1 and 2, and the corresponding descriptions in column 3, lines 22 - 34 and column 4, lines 8 - 13 and 42 - 53.

Initially, it is noted that Pavlick, et al discloses a lead or head end vehicle with crew accommodations. It is respectfully submitted that the disclosure in this patent would have neither taught nor would have suggested such a railway car formation as in the present claims, including plural car bodies being connected, and with both ends of a respective car body, of the railway car formation, constituting a portion of a passenger room, being equipped with parts that shrink in the longitudinal direction. It is respectfully submitted that Pavlick, et al is primarily concerned with providing a railroad train for hauling freight from one location to another (note columns 2, lines 40 - 45); and would have neither disclosed nor would have suggested structure as in the present claims, including the reduction/avoidance of impact force for a passenger room, e.g., of a passenger train.

In addition, it is noted that Pavlick, et al discloses a spring member 112 to cushion the impact after the low velocity impacts the bumper. That is, it is emphasized that Pavlick, et al discloses use of the spring; and after the resistance of the spring has been overcome, use of collision bulkheads toward the front and connected by collapsible tubes so that on high impact, the structures 16 and 20 will tend to collapse. Note, Figs. 4 - 6 and the description in column 4, lines 42 - 53 of Pavlick, et al. It is respectfully submitted that the disclosure of Pavlick, et al as a whole discloses relatively complex mechanical structures for absorbing impact; and it is respectfully submitted that this references does not disclose, nor would have suggested, the relatively softer end portions, particularly where such relatively softer end portions are provided by annealing, and advantages thereof, as in the present invention.

The contention by the Examiner that the material to form both longitudinal ends of the car body in Pavlick, et al is softer than the material used to form the

longitudinal center, is noted. The Examiner is respectfully requested to point out the specific portion of Pavlick, et al showing relatively softer material at the longitudinal ends. Again, as discussed previously, it is respectfully submitted that Pavlick, et al discloses a relatively complex series of mechanical techniques such as springs and shocks, for absorbing impact. Contrary to the contention by the Examiner, it is respectfully submitted that Pavlick, et al would have neither taught nor would have suggested the relatively softer longitudinal ends, providing advantages as in the present invention.

In addition, it is emphasized that the claims as presently amended do not merely recite relatively softer longitudinal ends, but rather recites that material of the longitudinal ends, which is softer, is material formed by annealing. It is respectfully submitted that the relatively complex structures of Pavlick, et al would have neither disclosed nor would have suggested the relatively softer material, formed by annealing, as in the present invention.

It is again emphasized that, according to the present invention, utilizing annealing, impact force reduction in passenger compartments of railway cars can be achieved by a relatively simple technique of the annealing. Particular, in view of advantages thereof, as compared with the relatively complex shock absorber/spring/additional structure in Pavlick, et al, it is respectfully submitted that Pavlick, et al would have neither taught nor would have suggested the presently claimed invention.

Even assuming, arguendo, that the applied U. S. Patent to Kawasaki, et al were prior art (note, e.g., International (PCT) Publication No. WO 00/18630), it is respectfully submitted that the combined teachings of Pavlick, et al and of Kawasaki, et al would have neither taught nor suggested the presently claimed subject matter,

including the relative softer material of the longitudinal ends, particularly having been made softer by annealing.

The applied U.S. Patent to Kawasaki, et al discloses a car body comprised of extruded stocks, to achieve weight reduction and strength enhancement. The structure in this patent particularly provides a side body, and is described, for example, in column 2, line 60 to column 3, line 9, and shown in Figs. 1 and 2.

Even assuming, arguendo, that the teachings of the U. S. Patent to Kawasaki, et al qualified as prior art, and were combinable with the teachings of Pavlick, et al, such combined teachings would have neither disclosed nor suggested the presently claimed subject matter, including that the material used to form longitudinal ends of the railway car is softer than the material used to form the longitudinal center portion thereof, with material of the longitudinal ends being material formed by annealing, and advantages thereof as discussed in the foregoing.

The Examiner is thanked for the indicated allowance of the subject matter of claims 8 and 14. Claims 8 and 14 have been rewritten to overcome issues raised by the Examiner under the second paragraph of 35 USC 112, being set forth in independent form as new claims 24 and 25. It is respectfully submitted that new claims 24 and 25 should be allowed.

In view of the foregoing comments and amendments, reconsideration and allowance of all claims now in the application are respectfully requested.

To the extent necessary, applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (Case: 648.41258X00), and please credit any excess fees to such deposit account.

Respectfully submitted,

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